IN THE CLAIMS:

1. (ORIGINAL) In an intermediate network device having a plurality of ports for forwarding network messages within a bridged network, a method for efficiently transitioning the ports among a plurality of spanning tree protocol (STP) states, the method comprising the steps of:

executing the STP at the intermediate network device so as to elect a root of the bridged network and to assign one of the device's ports to a Root Port Role, one or more of the device's ports to an Alternate Port Role, and one or more of the device's ports to a Designated Port Role;

transitioning the ports assigned to the Root Port Role and the Designated Port Role to a forwarding STP state;

transitioning the one or more ports assigned to the Alternate Port Role to a discarding STP state;

receiving a bridge protocol data unit (BPDU) message, the BPDU message having a proposal flag that is asserted; and

if the BPDU message was received on the port assigned the Root Port Role, leaving the one or more ports assigned to the Designated Port Role in the forwarding STP state, provided that the one or more ports assigned to the Alternate Port Role are in the discarding STP state.

2. (ORIGINAL) The method of claim 1 wherein the STP substantially complies with the Institute of Electrical and Electronics Engineers (IEEE) 802.1w Rapid Spanning Tree Protocol (RSTP) specification standard.

3. (ORIGINAL) The method of claim 1 wherein, in response to receiving the BPDU message with the proposal flag asserted, the device does not issue one or more BPDU messages from its ports assigned to the Designated Port Role.

1   4. (ORIGINAL) The method of claim 3 further comprising the step of issuing a BPDU

2   message from the port assigned to the Root Port Role, the issued BPDU message having

3   an agreement flag that is asserted.

1   5. (ORIGINAL) The method of claim 1 further comprising the steps of:

2   transitioning one or more ports assigned to the Designated Port Role to a discard-

3   ing STP state, if the BPDU message with the asserted proposal flag is received on a port

4   other than the port assigned to the Root Port Role; and

5   upon transitioning the one or more ports assigned to the Designated Port Role to

6   the discarding state, issuing a BPDU message from the port on which the BPDU message

7   with the asserted proposal flag was received, the issued BPDU message having an

8   agreement flag that is asserted.

1   6. (ORIGINAL) The method of claim 1 further comprising the step of, if the one or more

2   ports assigned the Alternate Port Role is not in the discarding STP state, placing such

3   ports in the discarding STP state.

1   7. (ORIGINAL) An intermediate network device configured to forward network mes-

2   sages within a bridged network, the device having a plurality of ports for connecting the

3   device to one or more network entities, the intermediate network device comprising:

4   a port role selection state machine configured to assign roles to the ports;

5   a port transition state machine configured to transition the ports among a plurality

6   of spanning tree protocol (STP) states depending on the assigned roles; and

7   a sync manager for use in executing the STP, wherein,

8   the port role selection state machine and the port transition state machine

9   cooperate so as to assign one of the device's ports to a Root Port Role, to assign

10   one or more of the device's ports to an Alternate Port Role, and to assign one or

11   more of the device's ports to a Designated Port Role,

12   the port role selection state machine and the port transition state machine

13   further cooperating to transition the ports assigned to the Root Port Role and the

14   Designated Port Role to a forwarding STP state and to transition the one or more

15   ports assigned to the Alternate port role to a discarding STP state, and

16   in response to receiving a bridge protocol data unit (BPDU) message hav-

17   ing a proposal flag that is asserted, the sync manager cooperates with the port

18   transition state machine to leave one or more of the ports assigned to the Desig-

19   nated Port Role in the forwarding STP state, provided that the BPDU message

20   was received on the port assigned the Root Port Role and further provided that the

21   one or more ports assigned to the Alternate Port Role are in a discarding STP

22   state.

1   8. (ORIGINAL) The intermediate network device of claim 7 further comprising a for-

2   warding engine configured to forward network messages received on a first port to one or

3   more second ports.

1   9. (ORIGINAL) The intermediate network device of claim 7 wherein the STP executed

2   by the device substantially complies with the Institute of Electrical and Electronics Engi-

3   neers (IEEE) 802.1w Rapid Spanning Tree Protocol (RSTP) specification standard.

1   10. (ORIGINAL) The intermediate network device of claim 7 further comprising a

2   BPDU message generator, wherein the sync manager cooperates with the BPDU message

3   generator to have a BPDU message issued from the port assigned to the Root Port Role,

4   the issued BPDU message having an agreement flag that is asserted.

1   11. (ORIGINAL) In an intermediate network device having a plurality of ports for for-

2   warding network messages within a bridged network, a method for efficiently transition-

3   ing the ports among a plurality of spanning tree protocol (STP) states, the method com-

4   prising the steps of:

4

5   executing the STP at the intermediate network device so as to elect a root of the

6   bridged network, to designate a port of the device to be the current root port and to assign

7   one or more of the device's ports to a Designated Port Role;

8   transitioning the ports assigned to the Designated Port Role to a forwarding STP

9   state;

10   receiving a bridge protocol data unit (BPDU) message, the BPDU message having

11   a proposal flag that is asserted; and

12   if the proposal-BPDU message was received on the current root port, leaving the

13   one or more ports assigned to the Designated Port Role in the forwarding STP state.

1   12. (ORIGINAL) The method of claim 11 further comprising the step of, if the proposal-

2   BPDU message was received on a newly elected root port, identifying the current root

3   port as a previous root port, transitioning the previous root port to a blocking STP state

4   and leaving the one or more ports assigned to the Designated Port Role in the forwarding

5   STP state.

1   13. (ORIGINAL) The method of claim 12 further comprising the step of issuing a BPDU

2   message from the port on which the proposal-BPDU message was received, the issued

3   BPDU message having an agreement flag that is asserted.

1   14-27. (CANCELLED)

1   28. (NEW) A method for transitioning ports of an intermediate network device among a

2   plurality of states, the method comprising the steps of:

3   executing the rapid spanning tree protocol (RSTP) on the intermediate network

4   device, the RSTP designating a first port of the device to a Root Port Role and

5   designating one or more second ports of the device to Designated Port Roles and placing

6   the one or more second ports in a forwarding state;

7   subsequent to the step of executing, reassigning the Root Port Role from the first

8   port to a third port of the device and blocking the first port;

9   receiving a bridge protocol data unit (BPDU) message on the third port, the

10   BPDU message having a proposal flag that is asserted (hereinafter proposal-BPDU); and

11   in response to the proposal-BPDU, maintaining the one or more second ports in

12   the forwarding state.

1   29. (NEW) The method of claim 28 further comprising the step of:

2   sending a BPDU message on the third port, the BPDU message having an ac-

3   knowledgment flag that is asserted.

1   30. (NEW) The method of claim 28 wherein the step of reassigning is performed in re-

2   sponse to detecting a failure of a link connected to the first port.

1 31. (NEW) The method of claim 28 wherein the step of reassigning is performed in re-

2 sponse to detecting the device failing to receive BPDU messages on the first port for a

3 preset period of time.

1 32. (NEW) The method of claim 28 wherein the step of reassigning is performed in re-

2 sponse to receiving a BPDU message indicating the third port is closer to a root device

3 than the first port.

1 33. (NEW) The method of claim 28 wherein the step of executing further comprises the

2 step of:

3   placing the first port in a forwarding state.

1 34. (NEW) The method of claim 28 wherein the step of reassigning further comprises

2 the step of:

3   transitioning the first port to a blocking state and the third port to a forwarding

4 state.

1 35. (NEW) The method of claim 28 further comprises the step of:

2   confirming that any ports designated to an Alternate Port Role are in the blocking

3 state.

1 36. (NEW) An intermediate network device configured to forward network messages

2 within a network, the device having a plurality of ports that transition among a plurality

3 of states, the device comprising:

4   means for executing the rapid spanning tree protocol (RSTP) on the intermediate

5   network device, the RSTP configured to designate a first port of the device to a Root Port

6   Role and to designate one or more second ports of the device to Designated Port Roles

7   and to place the one or more second ports in a forwarding state;

8   means for reassigning the Root Port Role from the first port to a third port of the

9   device and to place the first port in a blocking state;

10   means for receiving a bridge protocol data unit (BPDU) message on the third port,

11   the BPDU message having a proposal flag that is asserted (hereinafter proposal-BPDU);

12   and

13   means for maintaining the one or more second ports in the forwarding state, in

14   response to the proposal-BPDU.

1   37. (NEW) The intermediate network device of claim 36 further comprising

2   means for sending a BPDU message on the third port, the BPDU message having

3   an acknowledgment flag that is asserted.

1   38. (NEW) The intermediate network device of claim 36 further comprising:

2   means for transitioning the first port to a blocking state and the third port to a for-

3   warding state.

1   39. (NEW) The intermediate network device of claim 36 further comprising:

2   means for confirming that any ports designated to an Alternate Port Role are in

3   the blocking state.

1   40. (NEW) A computer readable medium containing executable program instructions

2   for transitioning ports of an intermediate network device among a plurality of states, the

3   executable program instructions comprising program instructions adapted to:

1   execute the rapid spanning tree protocol (RSTP) on the intermediate network de-

2   vice, the RSTP to designate a first port of the device to a Root Port Role and

3   to designate one or more second ports of the device to Designated Port Roles and to place

4   the one or more second ports in a forwarding state;

5   reassign the Root Port Role from the first port to a third port of the device and

6   block the first port;

7   receive a bridge protocol data unit (BPDU) message on the third port, the BPDU

8   message having a proposal flag that is asserted (hereinafter proposal-BPDU); and

9   maintain the one or more second ports in the forwarding state in response to the

10 proposal-BPDU.